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Health outcomes and healthcare use in children born into or growing up in single parent households: A systematic review

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Title

Health outcomes and healthcare use in children born into or growing up in single parent households: A systematic review

Authors

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Tables: 0

Figures: 0

Appendices: 1

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Abstract

Introduction

Up to a quarter of all children globally live in single parent households. Studies have concluded that children who grow up with continuously married parents have better health outcomes than children who grow up with single or separated parents. This is consistent across key domains including physical health, psychological wellbeing and educational attainment. Possible explanations include higher poverty and time limitations of parental engagement within single parent families, but these only represent a narrow range of mechanisms. We aim to identify and synthesise the evidence on how being born into and/or living in a single parent household as a child impacts on health, development and healthcare use compared to living in a two-parent household, and factors that may be driving differences.

Methods and Analysis

We will search Pubmed, Scopus, and ERIC and adapt our search terms for search engines and grey literature sites to include relevant conference abstracts and grey literature. We will restrict results to English language publications from 2000-2020 and screen against inclusion criteria. We will categorise main outcomes into five groups of outcomes: birth outcomes, mortality, physical health, mental health, development, and healthcare use. We will use the Newcastle-Ottawa scale to assess the methodological quality of studies. Narrative synthesis will form the primary analysis in the review. Synthesis of effect estimates without meta-analysis will follow the Synthesis Without Meta-Analysis (SWiM) guidelines.

Ethics and Dissemination

All documents used are publicly accessible. We will submit results to a peer-reviewed journal and international social science conferences. We will communicate results with single parent groups and relevant charitable organisations. This review will also be included in IL's thesis.

Registration Details

The protocol has been accepted to the International Prospective Register for Systematic Reviews (PROSPERO) database, registration number CRD42020197890.

Article Summary

Strengths and limitations of this study:

- This review will fill an evidence gap on the drivers and protective factors that influence the health and development of children in single parent households
- A robust methodology and extensive search strategy will support clear results to inform policies and interventions to support single household families

- Findings from included studies will likely be heterogenous in terms of definitions of single households and definitions and measurements of outcomes, precluding meta-analysis and making subgroup analyses difficult

Introduction

Between 10% and 25% of children in member countries of the Organisation for Economic Cooperation and Development (OECD) live in single parent households (1). In Great Britain, 15% of all families are headed by a single parent (2). The proportion of single parent families in Great Britain has remained stable over the last 20 years (3) following an increase of single parent families between 1970 and 1995 (4). The key reasons for this increase were rising levels of divorce and partnership breakdown during the 1970s and 1980s (2, 5) and an increase in the number of births to single women since the mid-1980s (4, 6, 7).

Multiple studies have concluded that children who grow up with continuously married parents have better outcomes than children who grow up with single parents or children whose parents separate during childhood (8-10). This is consistent across key domains including physical health (11), psychological wellbeing (12) and educational attainment (13).

A systematic review of maternal marital status and birth outcomes from 2010 has summarised the current literature on risks of an infant being born with low birth weight (<2500 g), preterm birth (<37 weeks gestational age) or small for gestational age (below the 10th percentile for babies of the same gestational age) among married and unmarried women (14). Findings identify significantly increased odds of low birth weight, preterm birth and small for gestational age births among unmarried women compared to married women. A further systematic review found that children in single parent households have higher body mass index and obesogenic behaviours such as insufficient physical activity and increased television viewing time compared to children living with two parents (15).

Children of single parents are at higher risk of living in poverty and deprivation compared to children growing up in coupled families (16). In 2018, 49% of children in single parent families live in poverty in England compared to 25% of children in coupled families (17). Socio-economic factors such as income, occupation and education (also referred to as socio-economic status or SES), are strongly associated with parental and child wellbeing (18). While it is clear that single parent families are disadvantaged with respect to socioeconomic status and health outcomes, it remains unclear whether SES fully explains differences in outcomes for children of single mothers compared to children with two parents. This is difficult to examine since the likelihood of becoming a single mother is very strongly associated with SES. Women with lower SES (based on their father's occupation) were up to six times more likely to become single mothers in a study of three large British suveys (19). The rate of relationship breakdown resulting in single motherhood was found to be almost double among women in unskilled work compared to women in professional or managerial roles (19).

A substantial body of research also exists on the health impact of parental relationship breakdown (a mode of entry into single parenthood) or reforming, on child health (20).

However, a review of literature up to 2005 concludes that children with two continuously married parents attain better cognitive and emotional outcomes compared to children with only one biological parent in the household (9) and this is more plausibly explained by higher deprivation and lower education among single mothers than by the impacts of a parental relationship breakdown (4).

Research on single parenthood has focused largely on single mothers, who head approximately 88% of single parent families globally (21). Women more often parent alone due to breakdown of a relationship or pursue motherhood without a partner from the point of conception than men (4). Research on the quality and quantity of fathering exists but has tended to focus on the impact of father absence rather than single father families (22). There are well-described challenges to capturing fathers in research (23, 24); even less is known about different types of single fathers than about about different types of single mothers.

Historically, official statistics have relied heavily on marital status to define single motherhood. Women who have had children with cohabiting partners and lived in a two-parent household have previously been grouped with single mothers, leading to inflation of the number of families that appeared to be led by non-partnered women (4). This is despite cohabiting households with children being one of the fastest growing family forms between 1980s-2000s in the UK and other countries (3). Single mothers who have separated from a partner, either via divorce or relationship breakdown, are likely to be different from women with no partner who become mothers (4) and report different parenting experiences (25). Capturing nuances in single parent households may be critical in understanding why children of single mothers have poorer outcomes compared to children of coupled mothers and identifying protective factors. Distinguishing between different types of and all routes into single parenthood is important as family structures have become more complex and new non-traditional family forms are being recognised (4, 26). Definitions and terminology matter not only to make sure we understand the comparisons we are making between groups but also to ensure that negative or stigmatising narratives associated with single motherhood are not perpetuated (27).

In this systematic review we will compare a range of health and development outcomes among children living in single parent households and children living in coupled parent households, and identify factors that may be driving differences. We will focus particularly on children who remain in single parent versus continuously coupled families but also include comparisons with cohabiting and married coupled families or different types of single parent families where available. We aim to fill gaps in evidence by exploring whether health disparities between children of single parents and children of coupled parents persist after adjustment for socioeconomic characteristics, presenting findings that explain the differences and reporting protective factors that allow children to be healthy in a single parent family. Our findings will highlight areas where policy change or public health interventions might help improve health of the large numbers of children living in single parent households.

Methods and Analysis

Aims and research questions

The aim of this review is to systematically identify and synthesise the evidence on how being born into and/or living in a single parent household as a child impacts on health, development and healthcare use compared to living in a two-parent household, and factors that may be driving differences.

This systematic review will answer the following questions:

1. How do health and development outcomes compare among children and young people (less than 18 years old) growing up in single parent and coupled parent households?
2. What factors influence any observed differences in child health and development outcomes between children of single parents versus coupled parents?

Searches

We will search for the concepts 'single parents' AND 'child health' OR 'child development' outcomes using indexed medical subject headings (MeSH) and free text terms, restricting results to English language publications from 2000-2020. We will search three databases which index medical, social science and education research: Pubmed, Scopus, and ERIC. We will identify additional relevant results through backwards and forwards citation searching and grey literature search engines. We provide the full list of search concepts and terms in appendix 1 (carried out on 15.07.20). We will adapt our search terms for search engines like Google Scholar and Scirus, and refer to the Canadian Agency for Drugs and Technologies in Health (CADTH) guidance for links to grey literature sites relevant in the UK context, to search for conference abstracts and grey literature or additional peer-reviewed articles.

Two researchers (IL and AA or IL and EI) will independently screen all results at the title and abstract stage and further screen full texts if the study's eligibility for inclusion remains unclear from the first screen. A third reviewer (PH or JW) will resolve any discrepancies.

Inclusion and exclusion criteria

The population of interest is children who have experienced living in a single parent household at any time during childhood (aged less than 18 years) and have at least one of the health outcomes measured in the study before the age of 18 years. We will include studies if the single parent is living with dependent children and does not have a partner living in the same home. We will exclude studies that focus exclusively on the health effects of parental relationship breakdown and do not also investigate the effects of single parenthood. We will include studies with any definition and measure of the five types of outcomes.

Outcomes

We present the main outcomes in this review in five groups:

1. Birth outcomes: including birth weight, low birth weight (<2500g), very low birth weight (<1500g), gestational age, small for gestational age (<10th percentile), preterm birth, congenital anomalies

2. Mortality outcomes: including stillbirth, perinatal mortality, child mortality
3. Physical health outcomes: including nutrition, weight, oral health, motor skills
4. Mental health and development outcomes: including disruptive behaviour, anxiety or depressive disorders, autism-spectrum disorders, psychosis, cognitive abilities (problem solving, memory, language/communication, early years educational attainment), social-emotional development (personal-social skills)
5. Healthcare use outcomes: including any hospital admission (planned or emergency), vaccinations, visits to primary care, contact with health visitors or well-child checks

Data extraction and management

For each included study, we will extract information on study authors and date of publication, study setting and period, study design (including selection criteria, number of participants and analysis), timings of single parenthood and outcomes of the study. All management of records and data will be done within the EPPI-Reviewer software.

Studies will be grouped by exposure groups and main outcomes. Exposure groups are likely to differ by the type, timing and duration of parental relationship status. Authors will be contacted if the time parameters of single parenthood is not clear from the published work. Outcomes will be grouped into the four main outcome groups defined above. We will use the Newcastle-Ottawa scale to assess the methodological quality of studies (28). We will use the Risk of Bias in Systematic Reviews (ROBIS) tool to guide our methods, originally designed for assessing risk of bias in the systematic review process of published reviews (29).

Synthesis and meta-analysis

Given the range of outcomes and the likely diversity in the way single parent households are defined across studies, we expect that the included studies will be too heterogeneous to carry out meta-analyses. Narrative synthesis will therefore form the primary analysis in the review. We will incorporate the four main elements described in the Economic and Social Research Council Methods Programme guidance on the conduct of narrative synthesis for systematic reviews (30). Reporting items of the synthesis of effect estimates without meta-analysis will follow the Synthesis Without Meta-Analysis (SWiM) guidelines (31).

We aim to synthesise results by distinct types of family forms (eg. single or coupled parents) and the age(s) at which a child is living in a single parent household. Where the age of the child during the exposure period or the duration of the exposure period is clearly reported, sub-group analyses will be carried out by age at which the child lived in a single parent household and by the length of exposure to single parenthood.

For each of the five main outcome groups, we will summarise the health and development outcomes most commonly reported and report any significant differences between children living with single parents and children living with coupled parents at any point during childhood. If any differences are reported between children living in different types of single parent households (separated single mothers vs never-married single mothers by choice), these will also be described. This will address our first research question. From included studies, we will identify factors such as employment or social support that influence differences in outcomes between children in single parent households and children in coupled parent households and may be responsive to policy change or intervention

targeting improvements in child health and development outcomes. This will address our second research question.

Should at least three studies employ the same design, and have similar exposure groups and outcomes, a decision will be made by the review team on whether meta-analysis is appropriate. A heterogeneity test (I^2 statistic) may be used to describe the percentage variability between studies and confirm whether it is reasonable to pool studies that appear comparable. Studies that have comparable exposures or outcomes but that are categorised as low quality based on the Newcastle-Ottawa scale however will not be included. Should a meta-analysis be appropriate, we will pool data using the DerSimonian and Laird random effects models (32). We will calculate odds ratios, presented using logarithmic scales will be calculated for dichotomous outcomes and weighted mean difference will be calculated for continuous outcomes. We will visualise results as forest plots.

Patient and public involvement

No patients were involved in the development of this protocol.

Ethics and Dissemination

No requests for ethical approval have been made given that all documents used are public accessible. We will submit results to a peer-reviewed journal for publication and international social science conferences. We will communicate results with single parent groups and relevant charitable organisations. This review will also be included in IL's thesis.

Authors' contributions

The protocol was conceived by all authors, written by IL in collaboration with PH and JW, and reviewed by AA and EI prior to submission.

Funding Statement

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Competiting Interests Statement

We declare no conflicts of interest.

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APPENDIX 1 – SEARCH STRATEGY

	PUBMED	
#1	single parents	"single parent"[MeSH Terms] OR "single parent*"[Title/Abstract] OR "lone parent*"[Title/Abstract] OR "lone mother*"[Title/Abstract] OR "lone father*"[Title/Abstract] OR "single father*"[Title/Abstract] OR "single mother*"[Title/Abstract] OR "single parent family"[Title/Abstract] OR "single parent families"[Title/Abstract] OR "single-parent family"[MeSH Terms] OR "unmarried parent*"[Title/Abstract] OR "marital status"[Title/Abstract] OR "marital status"[MeSH Terms] OR "family structure"[Title/Abstract]
#2	birth outcomes	"birth outcome*"[Title/Abstract] OR "birth weight"[MeSH Terms] OR "birth weight"[Title/Abstract] OR "infant, low birth weight"[MeSH Terms] OR "infant, premature"[MeSH Terms] OR "gestational age"[Title/Abstract] OR "preterm birth"[Title/Abstract] OR "congenital anomal*"[Title/Abstract]
#3	mortality	"child mortality"[Title/Abstract] OR "infant mortality"[Title/Abstract] OR "perinatal mortality"[Title/Abstract] OR "fetal mortality"[Title/Abstract] OR "stillbirth"[Title/Abstract] OR "stillbirth"[MeSH Terms]
#4	physical health	"child health"[MeSH Terms] OR "child health"[Title/Abstract] OR "pediatric obesity"[MeSH Terms] OR "child nutrition"[Title/Abstract] OR "eating habits"[Title/Abstract] OR "oral health"[Title/Abstract] OR "motor skills"[Title/Abstract]
#5	mental health and development	mental health[MeSH Terms] OR "educational status"[MeSH Terms] OR "cognitive abilit*"[Title/Abstract] OR "educational attainment"[Title/Abstract] OR "educational status"[Title/Abstract] OR "child behavior disorders"[MeSH Terms] OR "depressive disorder"[MeSH Terms] OR "anxiety disorders"[MeSH Terms]
#6	healthcare use	"hospital admission"[Title/Abstract] OR "emergency admission"[Title/Abstract] OR "healthcare use"[Title/Abstract] OR "health care use"[Title/Abstract] OR "healthcare utilisation"[Title/Abstract] OR "health visitor"[Title/Abstract] OR "primary care"[Title/Abstract] OR "vaccination"[MeSH Terms]
#7		#2 OR #3 OR #4 OR #5 OR #6
#8		#1 AND #7
#9		limit #8 to 2000-2020

	SCOPUS	
#1	single parents	TITLE-ABS ("single parent*" OR "lone parent*" OR "lone mother*" OR "lone father*" OR "single father*" OR "single mother*" OR "single parent family" OR "single parent families" OR "unmarried parent*" OR "marital status" OR "family structure")
#2	birth outcomes	TITLE-ABS ("birth outcome*" OR "birthweight" OR "gestational age" OR "preterm birth" OR "congenital anomal*")

#3	mortality	TITLE-ABS ("child mortality" OR "infant mortality" OR "perinatal mortality" OR "fetal mortality" OR "stillbirth")
#4	physical health	TITLE-ABS ("child health" OR "oral health" OR "pediatric obesity" OR "child nutrition" OR "eating habits" OR "motor skills")
#5	mental health and development	TITLE-ABS ("mental health" OR "disruptive behavior" OR "disruptive behaviour" OR "cognitive abilit*" OR "educational attainment" OR "educational status" OR "child development")
#6	healthcare use	TITLE-ABS ("healthcare use" OR "hospitalization" OR "hospitalisation" OR "hospital admission" OR "emergency admission" OR "vaccinat*")
#7		#2 OR #3 OR #4 OR #5 OR #6
#8		#1 AND #7
#9		limit #8 to 2000-2020

	SCOPUS	
#1	single parents	ti("single parent?" OR "lone parent?" OR "lone mother?" OR "lone father?" OR "single father?" OR "single mother?" OR "single parent family" OR "single parent families" OR "unmarried parent?" OR "marital status" OR "family structure") OR ab("single parent?" OR "lone parent?" OR "lone mother?" OR "lone father?" OR "single father?" OR "single mother?" OR "single parent family" OR "single parent families" OR "unmarried parent?" OR "marital status" OR "family structure")
#2	birth outcomes	ti("birth outcome?" OR "birthweight" OR "birth weight" OR "gestational age" OR "preterm birth" OR "congenital anomal?") OR ab("birth outcome?" OR "birthweight" OR "birth weight" OR "gestational age" OR "preterm birth" OR "congenital anomal?")
#3	mortality	ti("child mortality" OR "infant mortality" OR "perinatal mortality" OR "fetal mortality" OR "stillbirth") OR ab("child mortality" OR "infant mortality" OR "perinatal mortality" OR "fetal mortality" OR "stillbirth")
#4	physical health	ti("child health" OR "oral health" OR "pediatric obesity" OR "child nutrition" OR "eating habits" OR "motor skills") OR ab("child health" OR "oral health" OR "pediatric obesity" OR "child nutrition" OR "eating habits" OR "motor skills")
#5	mental health and development	ti("mental health" OR "disruptive behavior" OR "disruptive behaviour" OR "cognitive abilit?" OR "educational attainment" OR "educational status" OR "child development") OR ab("mental health" OR "disruptive behavior" OR "disruptive behaviour" OR "cognitive abilit?" OR "educational attainment" OR "educational status" OR "child development")
#6	healthcare use	ti("hospitalisation" OR "hospitalization" OR "hospital admission" OR "emergency admission" OR "healthcare use" OR "vaccinat?") OR ab("hospitalisation" OR "hospitalization" OR "hospital admission" OR "emergency admission" OR "healthcare use" OR "vaccinat?")

#7		#2 OR #3 OR #4 OR #5 OR #6
#8		#1 AND #7
#9		limit #8 to 2000-2020

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Page
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	2
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	7
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support:			
Sources	5a	Indicate sources of financial or other support for the review	7
Sponsor	5b	Provide name for the review funder and/or sponsor	7
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	N/A
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	3,4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	5
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	5
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	5
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	Appendix 1

Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	6
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	6
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	6
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	5-6
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	5-6
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	6-7
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	6-7
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	6-7
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	6-7
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	6-7
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	6-7
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	6-7

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Title

Health outcomes, healthcare use and development in children born into or growing up in single-parent households: A systematic review study protocol

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Abstract

Introduction

Up to a quarter of all children globally live in single-parent households. Studies have concluded that children who grow up with continuously married parents have better health outcomes than children who grow up with single or separated parents. This is consistent for key health and development outcomes including physical health, psychological wellbeing and educational attainment. Possible explanations include higher poverty and time limitations of parental engagement within single-parent families, but these only represent a narrow range of mechanisms. We aim to identify and synthesise the evidence on how being born into and/or living in a single-parent household compared to living in a two-parent household as a child impacts on health and development outcomes, healthcare use, and factors that may be driving differences.

Methods and Analysis

We will search Pubmed, Scopus, and ERIC and adapt our search terms for search engines and grey literature sites to include relevant conference abstracts and grey literature. We will restrict results to English language publications from 2000-2020 and screen against inclusion criteria. We will categorise main outcomes into five groups of outcomes: birth outcomes, mortality, physical health, mental health and development, and healthcare use. We will use the Newcastle-Ottawa scale to assess the methodological quality of studies. Narrative synthesis will form the primary analysis in the review. Synthesis of effect estimates without meta-analysis will follow the Synthesis Without Meta-Analysis (SWiM) guidelines.

Ethics and Dissemination

All documents used are publicly accessible. We will submit results to a peer-reviewed journal and international social science conferences. We will communicate results with single parent groups and relevant charitable organisations. This review will also be included in IL's PhD thesis.

Registration Details

The protocol has been accepted to the International Prospective Register for Systematic Reviews (PROSPERO) database, registration number CRD42020197890.

Article Summary

Strengths and limitations of this study:

- This review will fill an evidence gap on the drivers and protective factors that influence the health and development of children growing up in single-parent households
- A robust methodology and extensive search strategy will support clear results to inform policies and interventions to support single-parent households

- Findings from included studies will likely be heterogenous in terms of definitions of single-parent households, and definitions and measurements of outcomes, which may preclude meta-analysis

Introduction

Between 10% and 25% of children in member countries of the Organisation for Economic Cooperation and Development (OECD) live in single-parent households (1). In Great Britain, 15% of all families are headed by a single parent (2). The proportion of single-parent families in Great Britain has remained stable over the last 20 years (3) following an increase of single-parent families between 1970 and 1995 (4). The key reasons for this increase were rising levels of divorce and partnership breakdown during the 1970s and 1980s (2, 5) and an increase in the number of births to single women since the mid-1980s (4, 6, 7).

Multiple studies have concluded that children who grow up with continuously married parents have better outcomes than children who grow up with single parents or children whose parents separate during childhood (8-10). This is consistent for key health and development outcomes including physical health (11), psychological wellbeing (12) and educational attainment (13).

A systematic review of maternal marital status and birth outcomes from 2010 has summarised the current literature on risks of an infant being born with low birth weight (<2500 g), preterm birth (<37 weeks gestational age) or small for gestational age (below the 10th percentile for babies of the same gestational age) among married and unmarried women (14). Findings identify significantly increased odds of low birth weight, preterm birth and small for gestational age births among unmarried women compared to married women. A further systematic review found that children in single-parent households have higher body mass index and obesogenic behaviours such as insufficient physical activity and increased television viewing time, compared to children living with two parents (15).

Socio-economic factors such as income, occupation and education (also referred to as socio-economic status or SES), are strongly associated with both parental and child wellbeing (16). Children of single parents are at higher risk of living in poverty and deprivation compared to children growing up in coupled families (17). In 2018, 49% of children in single-parent families lived in poverty in England compared to 25% of children in coupled families (18). Women, who head approximately 88% of single-parent families globally (19), have lower earnings than men on average due to gender wage gaps and salary penalties for motherhood (20). Additionally, though the majority of single parents in OECD countries are in some form of paid employment, single parents are more likely to work in occupations with lower earning potential and job security, and must balance work responsibilities with childcare (21). While it is clear that single-parent families are disadvantaged with respect to socioeconomic status and health outcomes, it remains unclear whether SES fully explains differences in outcomes for children of single mothers compared to children with two parents. Other potential mechanisms linking single parenthood to a higher risk of adverse child health outcomes have been reported, including parenting stress, lack of social networks and support, and social stigma which can influence maternal mental health and effective parenting (11, 22). It is difficult to examine the extent to which each factor may

individually affect the association between living with a single parent and adverse health in children, particularly since the likelihood of becoming a single mother is very strongly associated with SES. Women with lower SES (based on their father's occupation) were up to six times more likely to become single mothers in a study of three large British surveys (23). The rate of relationship breakdown resulting in single motherhood was found to be almost double among women in unskilled work compared to women in professional or managerial roles (23).

A substantial body of research also exists on the health impact of parental relationship breakdown (a mode of entry into single parenthood) or reforming, on child health (24, 25). However, a review of literature up to 2005 concludes that children with two continuously married parents attain better cognitive and emotional outcomes compared to children with only one biological parent in the household (9) and this is more plausibly explained by higher deprivation and lower education among single mothers than by the impacts of a parental relationship breakdown (4).

Research on single parenthood has focused largely on single mothers. More often than men, women parent alone due to breakdown of a relationship or pursue parenthood without a partner from the point of conception (4). Research on the quality and quantity of fathering exists but has tended to focus on the impact of father absence rather than single-father families (26). There are well-described challenges to capturing fathers in research exploring the impact of parents on children's outcomes (27, 28); even less is known about different characteristics or sub-groups of single fathers than single mothers.

Historically, official statistics agencies have relied heavily on marital status to define single motherhood. The definition of a family, which has been based on blood or marriage ties in countries like the United States, drives the classification of one or two-parent families (29). Unmarried women who have had children with cohabiting partners and lived in a two-parent household have previously been grouped with single mothers, leading to inflation of the number of families that appeared to be led by non-partnered women (4). This is despite cohabiting households with children being one of the fastest growing family forms between 1980s-2000s in the UK and other countries (3). Single mothers who have separated from a partner, either via divorce or relationship breakdown, are likely to be different from women with no partner who become mothers (4) and report different parenting experiences (30). Capturing nuances in single-parent households may be critical in understanding why children of single mothers have poorer outcomes compared to children of coupled mothers and identifying protective factors. Distinguishing between different types of and all routes into single parenthood is important as family structures have become more complex and new non-traditional family forms are being recognised (4, 31). Definitions and terminology matter not only to make sure we understand the comparisons we are making between groups but also to ensure that negative or stigmatising narratives associated with single motherhood are not perpetuated (32).

In this systematic review we will compare a range of health and development outcomes among children living in single-parent households and children living in coupled-parent households, and identify factors that may be driving differences. We will focus particularly on children who remain in single-parent versus continuously coupled families but also

include comparisons with cohabiting and married coupled families, or sub-groups of single-parent families (separated single mothers, never-married single mothers by choice, single fathers) where available . We aim to fill gaps in evidence by exploring whether health disparities between children of single parents and children of coupled parents persist after taking into account socioeconomic characteristics, presenting findings that explain the differences and reporting protective factors that allow children to be healthy in a single-parent family. Our findings will highlight areas where policy change or public health interventions might help improve health of the large numbers of children living in single-parent households.

Methods and Analysis

Aims and research questions

The aim of this review is to systematically identify and synthesise the evidence on how being born into and/or living in a single-parent household as a child impacts on health outcomes, healthcare use and development outcomes, compared to living in a two-parent household, and factors that may be driving differences.

This systematic review will answer the following questions:

1. How do health, healthcare use and development outcomes compare among children and young people (less than 18 years old) growing up in single-parent and coupled-parent households?
2. What factors influence any observed differences in child health, healthcare use and development outcomes between children of single parents versus coupled parents?

Searches

We will search for the concepts 'single parents' AND 'child health' OR 'child development' outcomes using indexed medical subject headings (MeSH) and free text terms, restricting results to English language publications from 2000-2020. We will search three databases which index medical, social science and education research: Pubmed, Scopus, and ERIC. We will identify additional relevant results through backwards and forwards citation searching and grey literature search engines. We provide the full list of search concepts and terms in appendix 1 (carried out on 15.07.20). We will adapt our search terms for search engines like Google Scholar and Scirus, and refer to the Canadian Agency for Drugs and Technologies in Health (CADTH) guidance for links to grey literature sites relevant in the UK context, to search for conference abstracts and grey literature or additional peer-reviewed articles.

Two researchers (IL and AA or IL and EI) will independently screen all results based on title and abstract and further screen full texts for inclusion. A third reviewer (PH or JW) will resolve any discrepancies.

Inclusion and exclusion criteria

The population of interest is children who have experienced living in a single-parent household at any time during childhood (aged less than 18 years) and have at least one of the health outcomes measured in the study before the age of 18 years. We will include studies if the single parent (either mother or father) is living with dependent children and

does not have a partner living in the same home. Only studies with enough information to identify the single parent exposure group as we have defined it here will be included; studies where the exposure groups are married vs unmarried, without further specification of cohabitation status of parents, will be excluded.

Parents may transition in and out of relationships with different people (4, 33). While they may be consistently partnered, changes in family structure (also referred to as family instability) have also been shown to negatively impact on child outcomes (24). In this review, we will include studies that categorise children as 'ever having lived in a single-parent family during childhood' if the health impact of living with a single parent is also examined.

A substantial body of work shows that parental conflict and poor marital quality adversely affect behavioural outcomes, anxiety and depression and emotional security in children and adolescents (34, 35). However, in this systematic review we will exclude studies that focus exclusively on the health effects of parental relationship breakdown or quality without investigating the effects of single parenthood.

We will include studies with any definition and measure of the five types of outcomes. Studies employing quantitative study designs such as cohort, cross-sectional and case control studies will be included. A range of study types will provide a comprehensive view of the literature with a mix of well-powered studies, longitudinal data points and objectively measured outcomes.

Outcomes

We present the main outcomes in this review in five groups:

1. Birth outcomes: including birth weight, low birth weight (<2500g), very low birth weight (<1500g), gestational age, small for gestational age (<10th percentile), preterm birth, congenital anomalies
2. Mortality outcomes: including stillbirth, perinatal mortality, child mortality
3. Physical health outcomes: including nutrition, weight, oral health, motor skills
4. Mental health and development outcomes: including disruptive behaviour, substance abuse, anxiety or depressive disorders, autism-spectrum disorders, psychosis, self-harm and suicidality, cognitive abilities (problem solving, memory, language/communication, early years educational attainment), social-emotional development (personal-social skills)
5. Healthcare use outcomes: including any hospital admission (planned or emergency), vaccinations, visits to primary care, contact with health visitors or well-child checks

Data extraction and management

For each included study, we will extract information on study authors and date of publication, study setting (country and its World Bank income group classification if available) and period (year), study design (including selection criteria, number of participants and analysis, causal claims), timings and definition of single parenthood and

outcomes of the study. If available, we will additionally extract information about confounding variables that were controlled for, variables reported as effect modifiers of the relationship between single parenthood and child health and development, and variables that act as measures of socioeconomic status (for example, use of income support or tax credits, employment or access to health insurance) All management of included publications and extracted data will be done within the EPPI-Reviewer software.

Studies will be grouped by exposure groups (single-parent vs coupled-parent household) and main outcomes. Definitions of single parenthood may vary across studies and exposure groups are likely to differ by the type, timing and duration of parental relationship status. In most studies, the exposure is expected to be self-reported exposure or obtained from an administrative data source. Authors will be contacted if the time parameters of single parenthood are not clear from the published work.

Outcomes will be grouped into the five main outcome groups defined above. We will use the Newcastle-Ottawa scale to assess the methodological quality of studies (36). We will use the ROBINS-I tool for assessing risk of bias in non-randomised studies (37).

Synthesis and meta-analysis

Given the range of outcomes and the likely diversity in the way single-parent households are defined across studies, we expect that the included studies will be too heterogeneous to carry out meta-analyses. Narrative synthesis will therefore form the primary analysis in the review. To carry out a robust narrative synthesis, we will incorporate the four main elements described in the Economic and Social Research Council Methods Programme guidance on the conduct of narrative synthesis for systematic reviews (38). We will follow the nine reporting items of the synthesis of effect estimates without meta-analysis from the Synthesis Without Meta-Analysis (SWiM) guidelines (39) and discuss the limitations of the synthesis methods used.

We will first report how single parents are defined in each study, creating a typology based on the literature which will inform how studies are categorised for synthesis or subgroup meta-analysis. We then aim to synthesise results by distinct types of family forms (eg. single or coupled parents, married or cohabiting, single mother or single father) and the age(s) at which a child is living in a single-parent household. Where the age of the child during the exposure period or the duration of the exposure period is clearly reported, sub-group analyses will be carried out by age at which the child lived in a single parent household and by the length of exposure to single parenthood. Sub-group analyses will also be carried out separating single mothers and single fathers. Additional sub-group analyses or special attention in reporting will be considered to take into account socioeconomic status (based on SES indicators as available) and country context (based on World Bank income group classification) that could influence the association between single parents and child health.

For each of the five main outcome groups, we will summarise the health and development outcomes most commonly reported and report any significant differences between children living with single parents and children living with coupled parents at any point during childhood. If any differences are reported between children living in different sub-groups of single-parent households (separated single mothers vs never-married single mothers by

choice vs single fathers), these will also be described. This will address our first research question. From included studies, we will identify factors such as employment or social support that influence differences in outcomes between children in single-parent households and children in coupled-parent households. Identifying potential mechanisms impacting the relationship between single parenthood and child health (for example, access or family income) may inform policy change or intervention targeting improvements in child health and development outcomes. This will address our second research question.

Should at least three studies employ the same design, and have similar exposure groups and outcomes, a decision will be made by the review team on whether meta-analysis is appropriate. A heterogeneity test (I^2 statistic) may be used to describe the percentage variability between studies and confirm whether it is reasonable to pool studies that appear comparable. Studies that have comparable exposures or outcomes but that are categorised as low quality based on the Newcastle-Ottawa scale will not be included. Should a meta-analysis be appropriate, we will pool data using the DerSimonian and Laird random effects models (40). We will calculate adjusted measures of association (such as odds ratios, hazard rates and relative risk) presented using logarithmic scales, for dichotomous categorical outcomes and standardised mean difference for continuous outcomes. We will carry out separate meta-analyses for unadjusted and adjusted effect sizes to better understand the effects of confounding variables on the association between single parenthood and child outcomes. We will visualise results as forest plots. We will use funnel plots to assess publication bias (41).

Patient and public involvement

No patients were involved in the development of this protocol.

Ethics and Dissemination

No requests for ethical approval have been made given that all documents used are publicly accessible. We will submit results to a peer-reviewed journal for publication and international social science conferences. We will communicate results with single parent groups and relevant charitable organisations. This review will also be included in IL's PhD thesis.

Authors' contributions

The protocol was conceived by all authors, written by IL in collaboration with PH, KH and JW, and reviewed by AA and EI prior to submission.

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Competing Interests Statement

We declare no conflicts of interest.

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APPENDIX 1 – SEARCH STRATEGY

		PUBMED
#1	single parents	"single parent"[MeSH Terms] OR "single parent*"[Title/Abstract] OR "lone parent*"[Title/Abstract] OR "lone mother*"[Title/Abstract] OR "lone father*"[Title/Abstract] OR "single father*"[Title/Abstract] OR "single mother*"[Title/Abstract] OR "single parent family"[Title/Abstract] OR "single parent families"[Title/Abstract] OR "single-parent family"[MeSH Terms] OR "unmarried parent*"[Title/Abstract] OR "marital status"[Title/Abstract] OR "marital status"[MeSH Terms] OR "family structure"[Title/Abstract]
#2	birth outcomes	"birth outcome*"[Title/Abstract] OR "birth weight"[MeSH Terms] OR "birth weight"[Title/Abstract] OR "infant, low birth weight"[MeSH Terms] OR "infant, premature"[MeSH Terms] OR "gestational age"[Title/Abstract] OR "preterm birth"[Title/Abstract] OR "congenital anomal*"[Title/Abstract]
#3	mortality	"child mortality"[Title/Abstract] OR "infant mortality"[Title/Abstract] OR "perinatal mortality"[Title/Abstract] OR "fetal mortality"[Title/Abstract] OR "stillbirth"[Title/Abstract] OR "stillbirth"[MeSH Terms]
#4	physical health	"child health"[MeSH Terms] OR "child health"[Title/Abstract] OR "pediatric obesity"[MeSH Terms] OR "child nutrition"[Title/Abstract] OR "eating habits"[Title/Abstract] OR "oral health"[Title/Abstract] OR "motor skills"[Title/Abstract]
#5	mental health and development	mental health[MeSH Terms] OR "educational status"[MeSH Terms] OR "cognitive abilit*"[Title/Abstract] OR "educational attainment"[Title/Abstract] OR "educational status"[Title/Abstract] OR "child behavior disorders"[MeSH Terms] OR "depressive disorder"[MeSH Terms] OR "anxiety disorders"[MeSH Terms]
#6	healthcare use	"hospital admission"[Title/Abstract] OR "emergency admission"[Title/Abstract] OR "healthcare use"[Title/Abstract] OR "health care use"[Title/Abstract] OR "healthcare utilisation"[Title/Abstract] OR "health visitor"[Title/Abstract] OR "primary care"[Title/Abstract] OR "vaccination"[MeSH Terms]
#7		#2 OR #3 OR #4 OR #5 OR #6
#8		#1 AND #7
#9		limit #8 to 2000-2020

		SCOPUS
#1	single parents	TITLE-ABS ("single parent*" OR "lone parent*" OR "lone mother*" OR "lone father*" OR "single father*" OR "single mother*" OR "single parent family" OR "single parent families" OR "unmarried parent*" OR "marital status" OR "family structure")
#2	birth outcomes	TITLE-ABS ("birth outcome*" OR "birthweight" OR "gestational age" OR "preterm birth" OR "congenital anomal*")
#3	mortality	TITLE-ABS ("child mortality" OR "infant mortality" OR "perinatal mortality" OR "fetal mortality" OR "stillbirth")

#4	physical health	TITLE-ABS ("child health" OR "oral health" OR "pediatric obesity" OR "child nutrition" OR "eating habits" OR "motor skills")
#5	mental health and development	TITLE-ABS ("mental health" OR "disruptive behavior" OR "disruptive behaviour" OR "cognitive abilit*" OR "educational attainment" OR "educational status" OR "child development")
#6	healthcare use	TITLE-ABS ("healthcare use" OR "hospitalization" OR "hospitalisation" OR "hospital admission" OR "emergency admission" OR "vaccinat*")
#7		#2 OR #3 OR #4 OR #5 OR #6
#8		#1 AND #7
#9		limit #8 to 2000-2020

	SCOPUS	
#1	single parents	ti("single parent?" OR "lone parent?" OR "lone mother?" OR "lone father?" OR "single father?" OR "single mother?" OR "single parent family" OR "single parent families" OR "unmarried parent?" OR "marital status" OR "family structure") OR ab("single parent?" OR "lone parent?" OR "lone mother?" OR "lone father?" OR "single father?" OR "single mother?" OR "single parent family" OR "single parent families" OR "unmarried parent?" OR "marital status" OR "family structure")
#2	birth outcomes	ti("birth outcome?" OR "birthweight" OR "birth weight" OR "gestational age" OR "preterm birth" OR "congenital anomal?") OR ab("birth outcome?" OR "birthweight" OR "birth weight" OR "gestational age" OR "preterm birth" OR "congenital anomal?")
#3	mortality	ti("child mortality" OR "infant mortality" OR "perinatal mortality" OR "fetal mortality" OR "stillbirth") OR ab("child mortality" OR "infant mortality" OR "perinatal mortality" OR "fetal mortality" OR "stillbirth")
#4	physical health	ti("child health" OR "oral health" OR "pediatric obesity" OR "child nutrition" OR "eating habits" OR "motor skills") OR ab("child health" OR "oral health" OR "pediatric obesity" OR "child nutrition" OR "eating habits" OR "motor skills")
#5	mental health and development	ti("mental health" OR "disruptive behavior" OR "disruptive behaviour" OR "cognitive abilit?" OR "educational attainment" OR "educational status" OR "child development") OR ab("mental health" OR "disruptive behavior" OR "disruptive behaviour" OR "cognitive abilit?" OR "educational attainment" OR "educational status" OR "child development")
#6	healthcare use	ti("hospitalisation" OR "hospitalization" OR "hospital admission" OR "emergency admission" OR "healthcare use" OR "vaccinat?") OR ab("hospitalisation" OR "hospitalization" OR "hospital admission" OR "emergency admission" OR "healthcare use" OR "vaccinat?")
#7		#2 OR #3 OR #4 OR #5 OR #6
#8		#1 AND #7
#9		limit #8 to 2000-2020

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Page
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	2
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	7
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support:			
Sources	5a	Indicate sources of financial or other support for the review	7
Sponsor	5b	Provide name for the review funder and/or sponsor	7
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	N/A
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	3,4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	5
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	5
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	5
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	Appendix 1

Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	6
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	6
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	6
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	5-6
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	5-6
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	6-7
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	6-7
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	6-7
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	6-7
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	6-7
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	6-7
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	6-7

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

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